CHAPTER 3.0

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

3.1 PROPOSED ACTION

Lawrence Berkeley National Laboratory proposes to construct the Molecular Foundry, a six-story laboratory building of approximately 86,500 gross square feet and a utility building of about 8,000 gross square feet, in the southeast corner of the LBNL site. It would be used for the interdisciplinary exploration and study of nanosciences, and would be a national use facility open to visiting scientists. Construction would take place between January 2004 and February 2006.

3.1.1 OPERATIONS

STAFFING

Approximately 137 staff and students would occupy the Molecular Foundry. Staff includes directors; scientific, technical and administrative personnel; and visiting scientists. LBNL estimates that approximately 24 of the future Molecular Foundry staff are currently employed within the LBNL site; these would contribute to filling the projected 59 new staff positions. In addition, 42 visiting scientists would occupy the Molecular Foundry building along with an estimated 36 students and post-doctoral fellows using the laboratories.

It is assumed that the estimated 24 current LBNL staff who would join the Molecular Foundry from existing positions at LBNL would create vacancies that would most likely be filled within one year of their leaving. For that reason, with the exception of the six Directors, all 137 staff positions are considered in the analysis for impacts. The six Directors would not be replaced and would likely retain their office and lab spaces in their current LBNL locations, as well as in the new buildings.

3.1.2 BUILDING DESIGN

The Molecular Foundry facility would consist of two buildings: a six-story 86,500-gsf Molecular Foundry, and 8,000-gsf Central Utility Plant (see Figure 6) for a total approximate building area of 94,500 gsf. The Molecular Foundry would include both buildings and other proposed site improvements, and would include wet and dry laboratories, laboratory support facilities, equipment rooms, conference/seminar rooms, and offices. In addition, “specialty” rooms

TABLE 1
ANTICIPATED MOLECULAR FOUNDRY STAFF

Category	Molecular Foundry Staffing Levels[1]
Directors	6
Scientific Staff	25
Technical Staff	18
Administrative Staff	10
Visiting Scientists	42
Students / Post Docs	36
Totals	137

[1] Numbers are estimates and may be approximate.

SOURCE: Lawrence Berkeley National Laboratory (2002)

consisting of controlled temperature rooms, low vibration rooms and "clean" rooms would be provided. Figures 4, 5, 6, and 7 provide a cross-section and floor plans for the proposed Molecular Foundry building.

Laboratory suites, totaling approximately 28,500 assignable square feet (sf), would provide the Molecular Foundry with wet and dry laboratories, scientific support equipment space, and shared workstations for laboratory technicians. Private offices and workstation areas also would be provided for employees, visitors, and students. The Molecular Foundry would house facilities for research in six areas (see Figure 7). Figures 8, 9, and 10 provide proposed floor plans. The first floor, concrete slab-on-grade, would accommodate isolated, vibration-controlled, mass dampening equipment foundations for the Imaging and Characterization Laboratory. All laboratories would be constructed as semi-clean room space, with controls to maintain the pressure in the labs with respect to adjacent vestibules. The laboratory spaces would also be constructed to easily adapt to changing research needs for size, layout, temperature and pressure control, cleanliness, and utilities. The Foundry would include 48 fume hoods associated with its proposed laboratories. All fume hoods would exhaust to the roof and would meet all applicable vertical velocity and stack height requirements. The expected useful life of the building would be 50 years.

One of LBNL's goals is to incorporate cost-effective sustainable design principles into all LBNL construction. The Molecular Foundry's environmental impact would be minimized through its proposed building materials; waste minimization; energy and atmospheric impact minimization; water use efficiency; and environmental quality. As part of the Proposed Action, LBNL prepared a Conceptual Design Report that includes a complete list of the sustainable building design features that would be considered during design. The structural design would account for all loads to which the structure may be subject, including dead, live, wind, and seismic. The design would comply with the requirements of the California Building Code (CBC) and LBNL's "Lateral Force Design Criteria."

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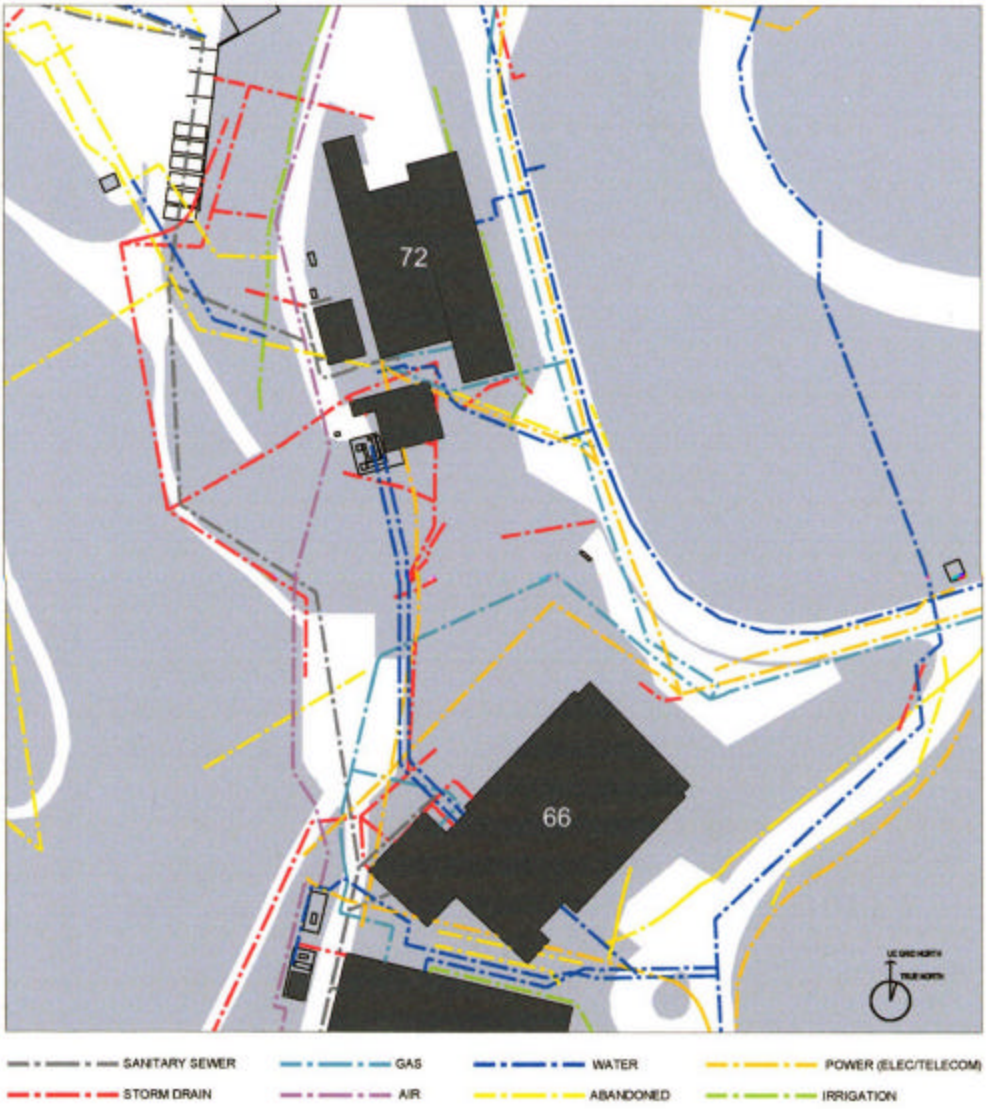
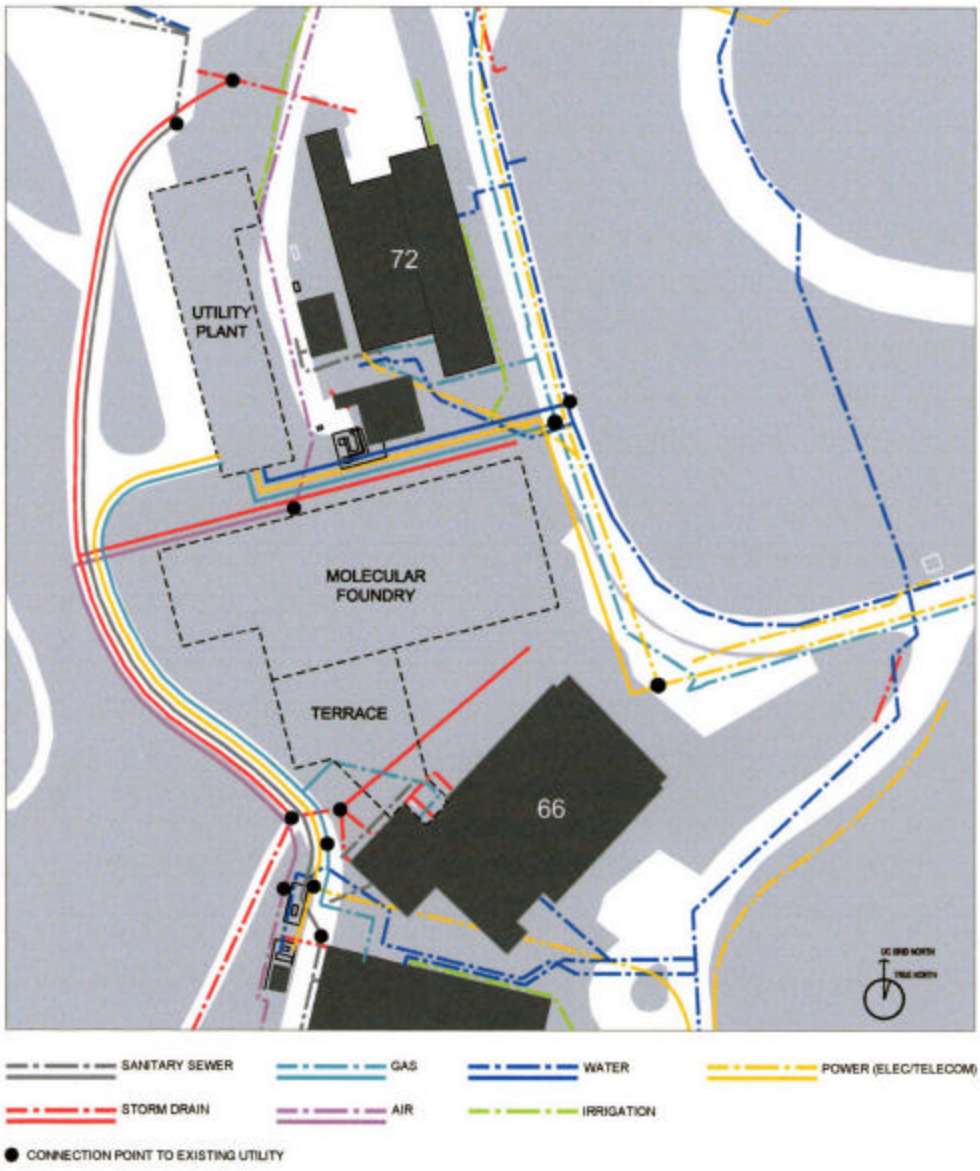


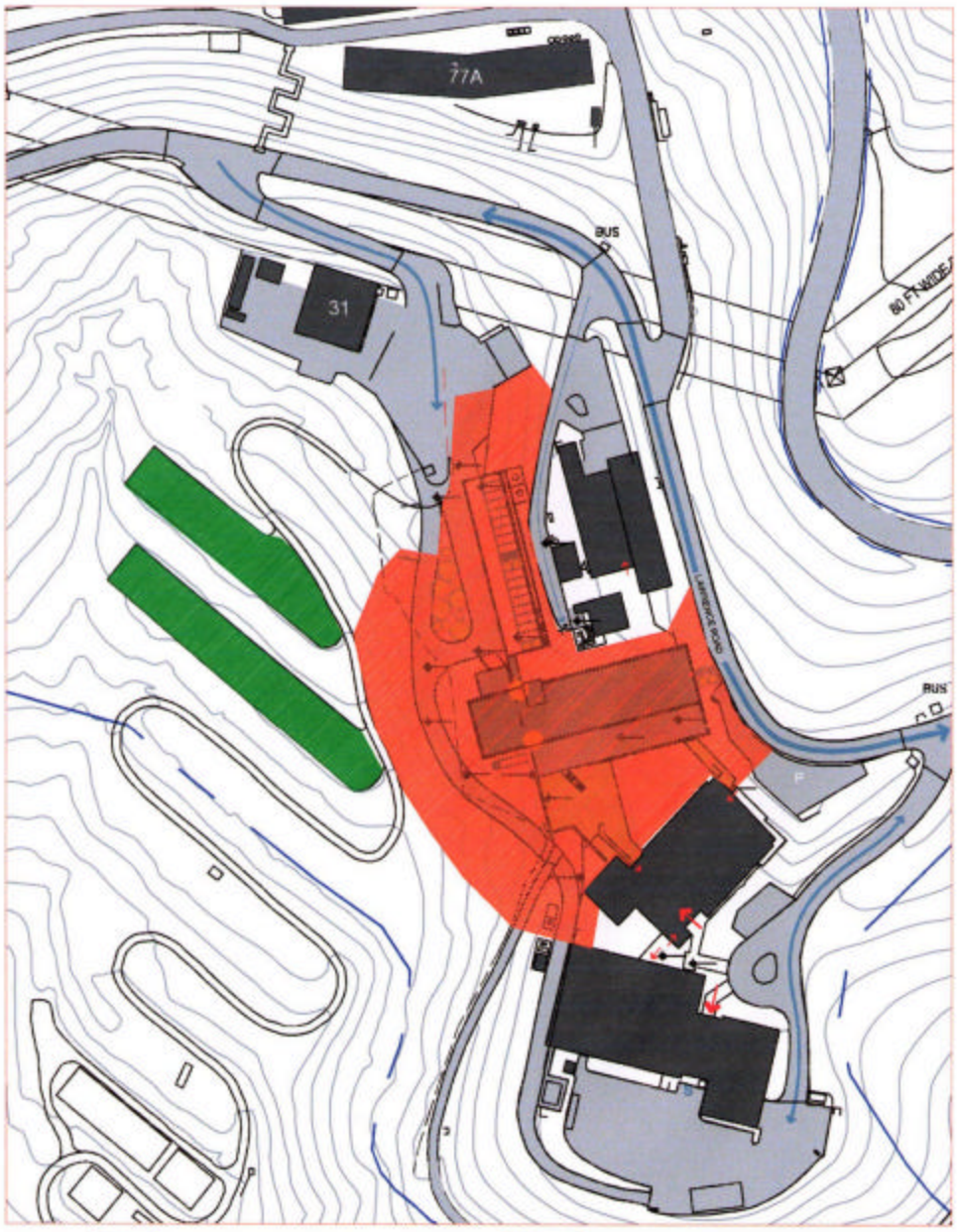
SOURCE: Lawrence Berkeley National Laboratory (2002)

Figure 3
Existing Project Site
with Existing Utilities



SOURCE: Lawrence Berkeley National Laboratory (2002)

Figure 4
Proposed Molecular Foundry Footprint
and Proposed Utilities

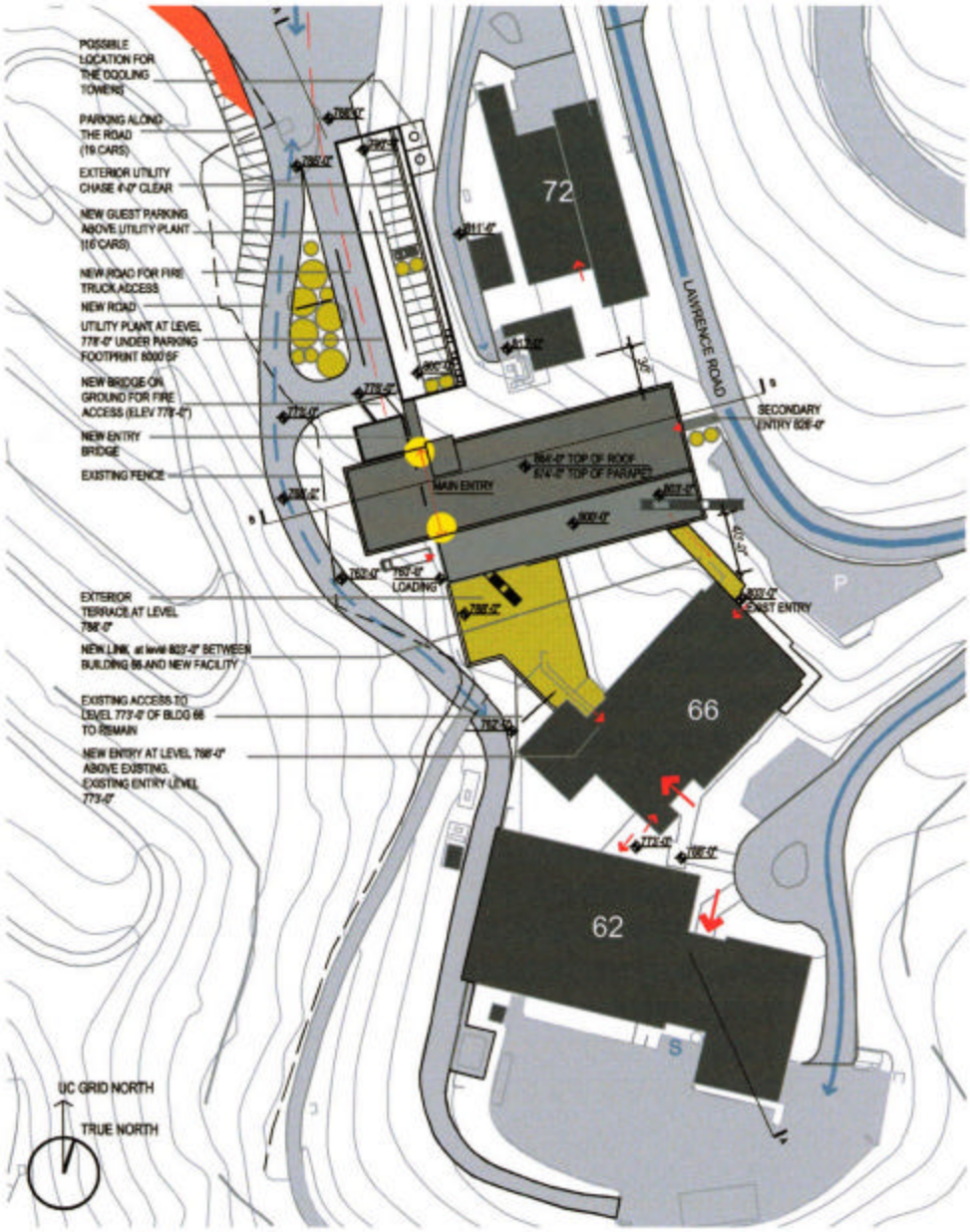


SOURCE: Lawrence Berkeley National Laboratory (2002)

LBNL Molecular Foundry / 202211 ■

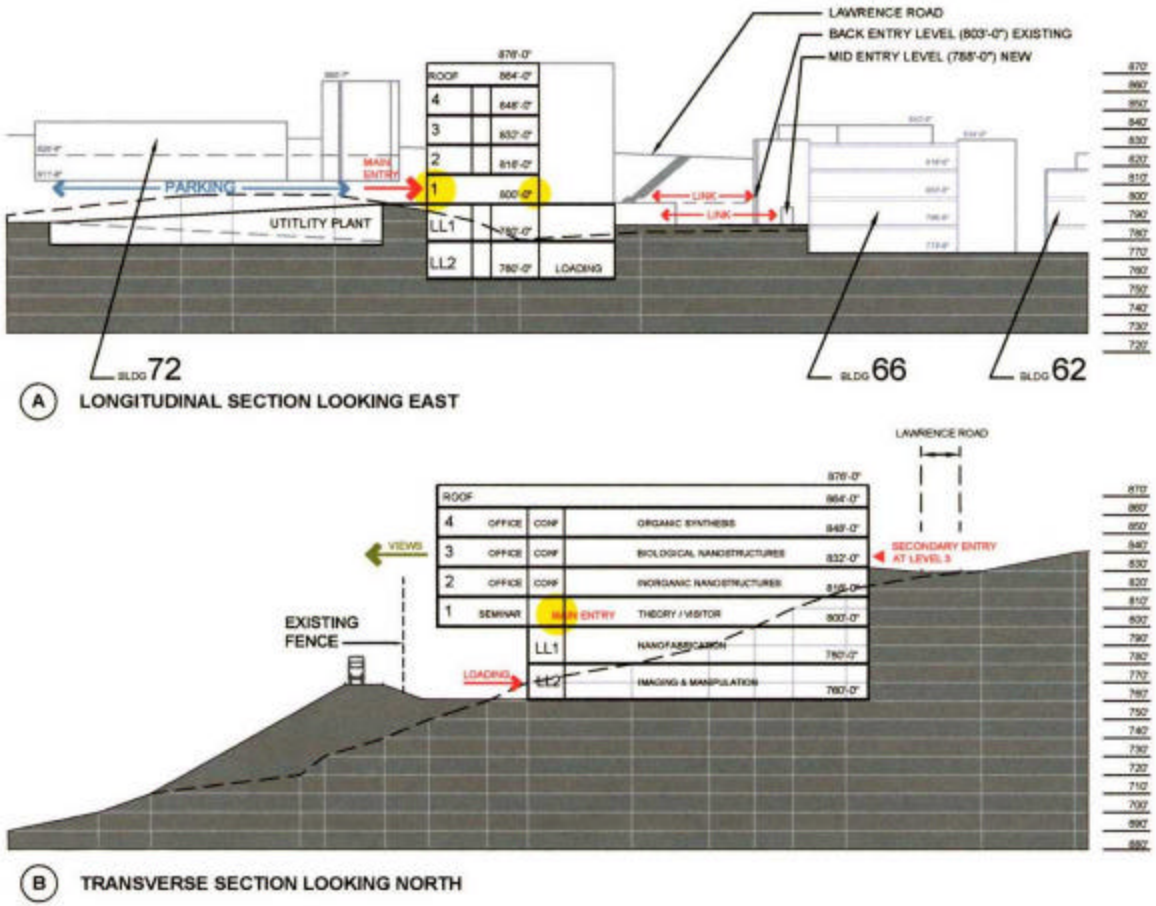
Figure 5

Area of Disturbance for Construction of the Molecular Foundry



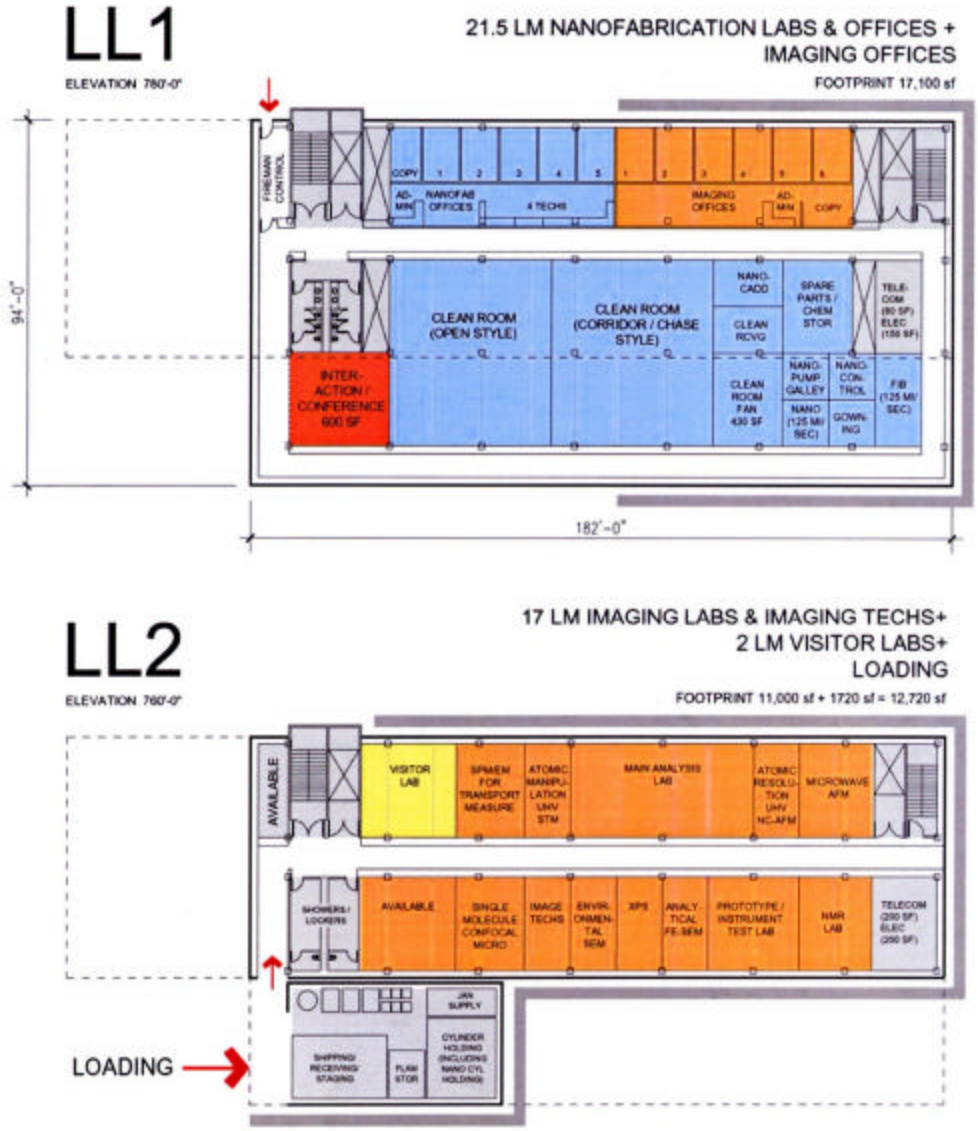
SOURCE: Lawrence Berkeley National Laboratory (2002)

Figure 6
Molecular Foundry Site Plan



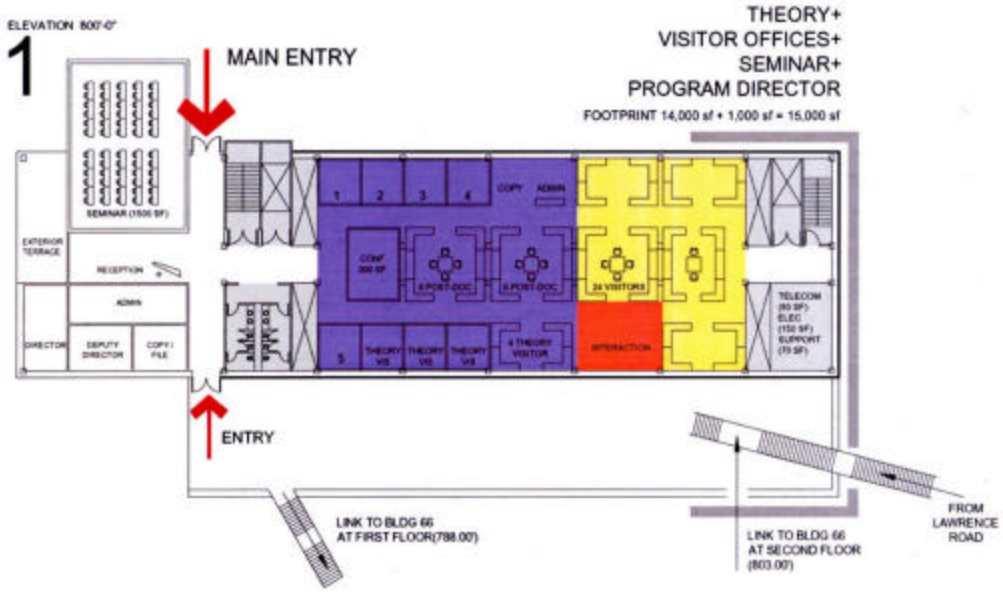
SOURCE: Lawrence Berkeley National Laboratory (2002)

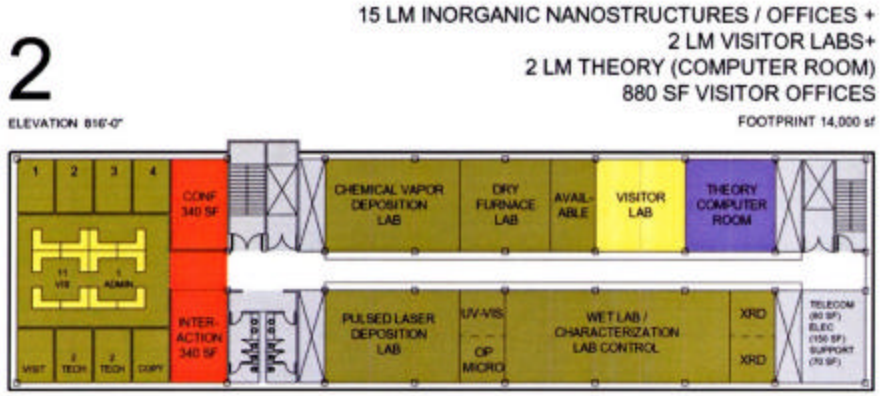
Figure 7
Molecular Foundry Elevations



SOURCE: Lawrence Berkeley National Laboratory (2002)

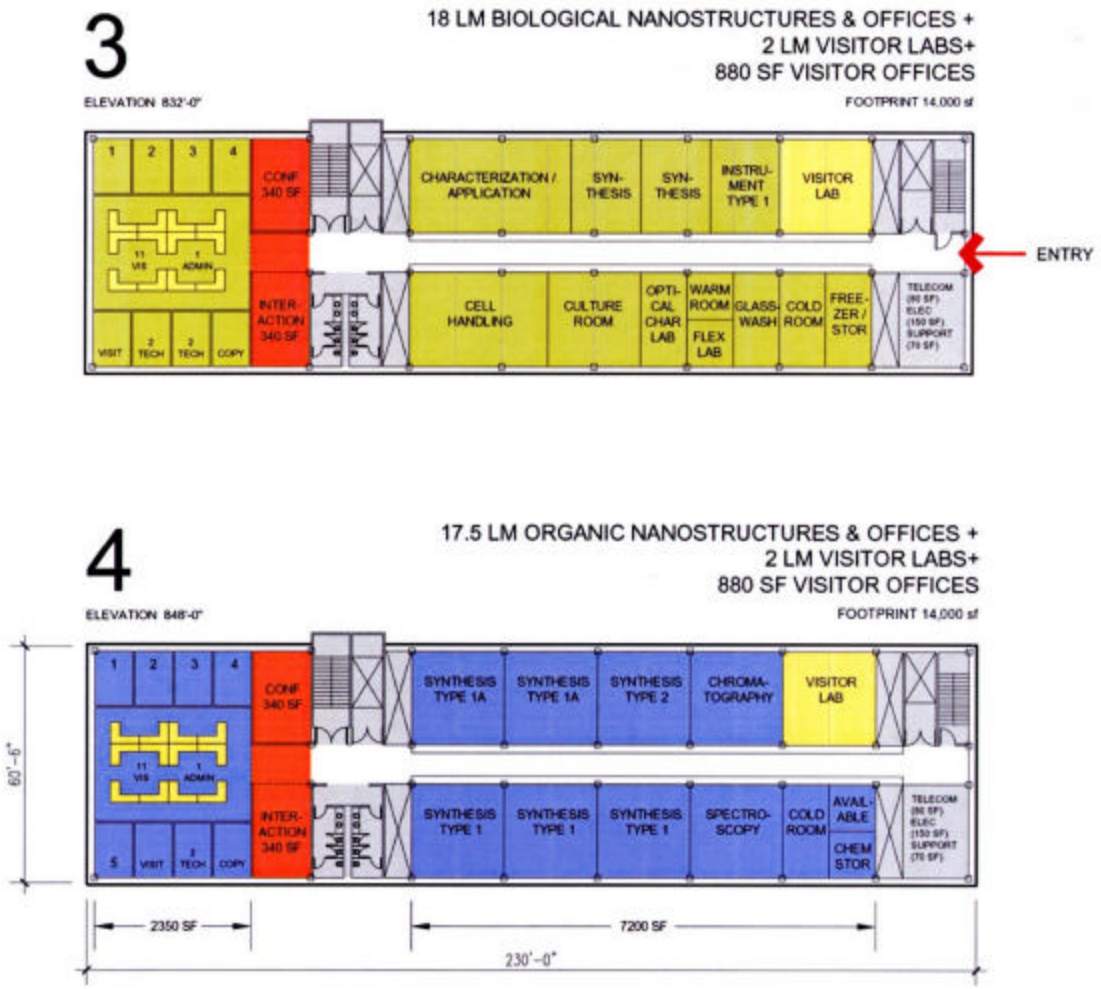
Figure 8
Floor Plans of Nanofabrication and Imaging Labs and Offices





SOURCE: Lawrence Berkeley National Laboratory (2002)

Figure 9
Floor Plans of Theory Offices and Inorganic Nanostructures and Offices



SOURCE: Lawrence Berkeley National Laboratory (2002)

Figure 10
Floor Plans of Biological and Organic Nanostructures and Offices

The exterior skin of the building would be a non-reflective material that would minimize glare and exterior maintenance. The building roof would be a single sheet co-polymer roofing membrane system with heat reflective coating to reduce solar gain. Metallic screens would be located on the roof to conceal rooftop mechanical exhaust equipment.

The Molecular Foundry would also be designed in conformance with requirements for Group "B" and "H-8" research laboratory occupancies as defined by the CBC, Type II Fire Resistive Construction, and with seismic safety and fire safety code requirements. The building would comply with disabled accessibility requirements in accordance with the Americans with Disabilities Act (ADA).

The proposed Central Utility Plant (CUP) building would be oriented along a north/south axis perpendicular to the adjacent Molecular Foundry and would be constructed to accommodate approximately 16 overhead surface parking spaces (i.e., on its roof) (see Figure 7, Longitudinal Section Looking East). This rooftop would also provide pedestrian access to the main entrance of the Molecular Foundry on its first floor. As described in Table 2, the Central Utility Plant building would house the various utility systems needed for the Molecular Foundry, including equipment for heater boilers, chillers and the chilled water pumps, air handling units, fans, an electrical distribution system, and connections to the LBNL existing fire alarm system.

3.1.3 CIRCULATION

As further described below, as part of the Proposed Action, vehicular access to the project site would be accommodated by the extension of Lee Road, which would result in a semi-circular road that loops around the project site. The Proposed Action would therefore be accessible from two locations along Lawrence Road: at the three-way intersection of the proposed new extension of Lee Road, the Building 31 parking lot, and Lawrence Road north of the project site; and at the intersection of Lee Road and Lawrence Road, west of the project site.

In addition to vehicular access, the Proposed Action design addresses three other types of circulation: building occupant / pedestrian traffic circulation, service access, and fire truck / emergency services access. Entrances to the Molecular Foundry building would be located as follows: LL2[2] (bottom floor), loading dock on the south side of the building; LL1 (upper basement floor), on the north side of the building; first floor, main entrance on the north side, secondary main entrance on the south side; and third floor, on the east side. Access to the Central Utility Plant building would be provided on the southwestern corner of the building.

Each floor of the Molecular Foundry building would be organized around a main corridor that would access the labs, offices, meeting rooms, stairs, elevators, and building entrances (see Figures 8, 9, and 10). All foot traffic through the buildings would be routed through these main corridors, stairs and elevators. Outside the building, an exterior, landscaped terrace would span the distance between Building 66 and the proposed Molecular Foundry building, and would facilitate access between the two. (See Figures 6 and 7, Longitudinal Section Looking East.)

[2] The abbreviation "LL" means "lower level" (see Table 1 Figures and 7 and 8).

TABLE 2
MOLECULAR FOUNDRY BUILDING SUMMARY

Building Level	General Function	Square Feet (sq. ft.)	Description of Facilities
4	Organic Nanostructures	13,920 sq. ft.	Visitor offices, administrative offices, conference room, interaction room, visitor lab, chromatography lab, spectrography lab, cold room, synthesis labs
3	Biological Nanostructures	13,920 sq. ft.	Visitor offices, administrative offices, conference room, interaction room, visitor lab, culture room, cell handling, optical characterization lab, warm room, freezer/storage room, cold room, glass wash room, synthesis labs, characterization/ application lab, instrument lab
2	Inorganic Nanostructures	13,920 sq. ft.	Visitor offices, administrative offices, conference room, interaction room, chemical vapor lab, dry furnace lab, visitor lab, dry computer room, pulsed laser deposition lab, wet lab/characterization lab control, flexible space
1	Theory	14,920 sq. ft.	Main entrance, receptionist, seminar room, administrative offices for Program Director and staff, visitor offices, post-doctoral student space. Would also include link to Building 66 at first and second floors, and pedestrian link from Lawrence Road
Lower Level 1	Nanofabrication Labs	17,100 sq. ft.	Interaction and conference room, clean rooms, administrative/staff offices for imaging and nanofab offices, clean rooms, chemical storage, gowning area
Lower Level II	Imaging Labs	12,720 sq. ft.	Atomic manipulation UHV system, SPM/EM for transport measure, visitors labs, main analysis lab, atomic resolution UHV NC-AFM, microwave AFM, showers/lockers, shipping/receiving, flammable storage, cylinder holding, janitorial supply room, prototype/instrument test lab, NMR lab
SUBTOTAL		86,500 sq. ft.	
N/A	Utility Plant	8,000 sq. ft.	HVAC cooling towers, generator, electrical substations, treated water fluid coolers, chemical treatment facilities, water heaters, air intake and exhaust, an office/shop, pumps, treated water system, etc.
TOTAL	(NA)	94,500 sq. ft.	(NA)

SOURCE: Lawrence Berkeley National Laboratory (2002); ESA (2002)

Specifically, a stairway from the terrace to the balcony of the Molecular Foundry building would provide access to the southside main entrance on the first floor. A walkway northeast of the terrace would similarly allow direct access between the Molecular Foundry balcony and Building 66. A stairway northeast of the Molecular Foundry building would provide access to the Lawrence Road parking lot, upslope. A short walkway, connecting to Building 72 to the north, would allow direct pedestrian access from Lawrence Road to the third floor entrance of the building. Access to the northside main entrance would be provided from a pedestrian walkway connecting the Molecular Foundry building to the surface parking lot atop the partially below-grade Central Utility Plant building.

Service entry, delivery, and truck loading would take place at the westside entrance and loading-bay of the Molecular Foundry building on LL2 (the bottom floor of the building). The service yard is screened from view by a retaining wall to the east and by a landscape wall to the north.

Fire truck and emergency service access would be accommodated from Lee Road and adjacent to the Central Utility Plant building parking lot, north of the Molecular Foundry building. This access would also provide sufficient turn-around for emergency vehicles back onto Lee Road. Additional access would be provided further along Lee Road to the west and southwest of the building. Fire and emergency vehicle access to the east of the building would be provided from Lawrence Road.

ROADWAY DESIGN AND PARKING

The Proposed Action includes the extension of Lee Road by approximately 350 linear feet, from the southwest corner of Building 66 in a north/northwest direction to the parking area of Building 31. Lee Road intersects Lawrence Road northeast of Building 66, and follows a southwestern route, running along the eastern side of Buildings 62 and 66, curving around the southern perimeter of Building 62, and then running along the western sides of Buildings 62 and 66 to the project site (see Figure 6). In addition, as part of the Proposed Action, a 160-foot portion of Lee Road, located at the southwest end of Building 62, would be widened from approximately 18 feet to approximately 24 feet to safely accommodate two-way traffic. The proposed extension and widening would use soil excavated for construction of the Molecular Foundry complex.

Construction of the Proposed Action would displace approximately 18 existing parking spaces currently serving the Building 66/62 rear parking lot. Approximately 16 new parking spaces would be provided on the partially-above-grade-level rooftop of the Central Utility Plant building. The CUP building would be constructed with overhead reinforced concrete flat plate spanning from exterior supports spaced atop structural columns to support the parking load. Approximately 35 to 40 additional spaces would be required to serve the Proposed Action and to maintain LBNL's desired parking ratio of 1.7 full-time equivalents (employees) per parking space. Those additional spaces would come from the general LBNL pool of about 2,400 parking spaces.

3.1.4 SITE FEATURES

STORM DRAINAGE

The Proposed Action would add approximately 1.5 acres of impervious surface to the project site, which is less than 0.26 percent of the total watershed area of 585 acres. This would be added to the approximately 20 acres of existing impervious surface in the watershed. About half of this impervious surface is on land managed by LBNL. Surrounding undeveloped areas would remain undeveloped and permeable and would continue to support grassland and tree groves. Roads, walkways and parking areas would be paved with asphalt concrete or Portland cement concrete capable of handling appropriate vehicular and pedestrian traffic; state-of-the-art porous pavement would be considered for use where practical. To the greatest extent possible, existing pervious surfaces would be preserved to minimize the amount of storm runoff. The terrace area would be a combination of paved and planted areas.

The Proposed Action would route surface water runoff into the LBNL storm drain system at points downslope and to the south and southeast of the Proposed Action. The Proposed Action would re-route an existing 12-inch storm sewer line that services this area along the newly constructed sections of Lee Road located south of the project site. This rerouted portion of the storm sewer line would extend approximately 450 feet from the northwestern area of Building 72 to the southwestern area of Building 66. New site storm drainage would collect and discharge in this re-routed 12-inch line.

Where relocation of existing storm drainage facilities is required, measures would be taken to provide controlled diversion of storm water during construction. Specific erosion control measures would be detailed in the site-specific storm water permit for construction activities. Disturbed areas would receive final landscaping and seeding at the earliest practical time during construction so that ground cover would be well established by the next rainy season.

The drainage system would be capable of handling a 25-year storm of 2.5 inches of rain per hour and would be tied into the existing storm sewer at a junction approximately 50 feet south of the project site. Rainwater from the roof and balcony areas would be considered for collection and storage on-site for re-use as non-potable landscape irrigation water, and in other reclaimed water programs. Surface water drainage from the project site would be managed through the existing storm drain system, which discharges to a detention basin formed by a dam in Strawberry Creek.

All storm water discharged from LBNL must conform to LBNL's Storm Water Pollution Prevention Plan (SWPPP) and National Pollutant Discharge Elimination System (NPDES) permit, as required by the Clean Water Act and the State Water Resources Control Board. Oversight and enforcement of LBNL's SWPPP and NPDES permit are performed by the San Francisco Bay Regional Water Quality Control Board and the City of Berkeley.

EARTHWORK

The Proposed Action would require excavation of approximately 32,000 cubic yards of soil to construct the Molecular Foundry building and the Central Utility Plant building, and to otherwise prepare the site for roads and walkways. This fill material would not leave the site, but would be used as engineered fill to construct the new Lee Road extension along the western perimeter of the Molecular Foundry buildings, and for the widening of Lee Road southwest of Building 62.

In all areas where excavations are to be made or fill deposited, the topsoil would first be stripped and stockpiled on-site for dressing finished slopes and for use in landscaped areas. Cut and fill slopes would not be steeper than recommended by registered geotechnical engineers. Edges of cut banks would be rounded to blend into the natural terrain. Because excavations would be in the vicinity of existing buildings, shoring, bracing and underpinning designed by a Professional Engineer would be used to secure excavations. Based on long-term environmental investigations as well as site soil sampling conducted in January 2002, the site appears to be free of contamination or chemicals of potential concern.

LANDSCAPING

The Proposed Action would require the removal of approximately three-dozen trees to accommodate building footprints, roads, grading, and construction activities. These trees include Monterey pine, coastal redwood, coast live oak, and bay trees, most of which are located in the area adjacent to the western and southern faces of Building 72. Fewer than one dozen trees to be removed are downslope from the Building 66 rear parking lot, where trees occur in generally isolated patches. Much larger groves, consisting of up to several hundred trees each, located in the general vicinity, would remain untouched by the Proposed Action, including a large screening grove of Canary Island pines to the west, a grove of screening redwoods to the southwest, a riparian corridor of various trees to the west and southwest, and several contiguous groves of oak, bay, acacia, and eucalyptus trees stretching from south of the project to the northeast.

The Proposed Action would transplant up to ten redwood or similarly sized trees along the western perimeter of Lee Road to provide screening for the Proposed Action. Trees would be positioned to maximize screening benefits. In addition, replacement trees would be planted or transplanted in various locations in and surrounding the project site, particularly in the area between the Lee Road extension and the proposed Central Utility Plant building, which would receive about one dozen trees. All landscaping placed by the Proposed Action would be irrigated as necessary. In addition, as part of the final design process, irrigation would be designed so as to minimize overspray and runoff. Irrigation and landscaping are expected to be consistent with the State Model Water Efficient Landscape Ordinance AB325.

The conceptual landscaping plan for the project site consists of three zones: a “crafted” zone to be located to the south, “natural” zones to the west and east, and a parking zone to the north. The crafted zone would include the elevated terrace space between Building 66 and the Proposed Action, and would incorporate both hard and soft landscaping elements to physically and visually connect and unify the building uses. The natural zone includes the fire-resistant ground cover for

erosion control, as well as decorative plant materials that would be selected based on their indigenous, low-maintenance, and especially water-saving characteristics. Finally, the parking zone, which would also include some planted areas, would be located atop the proposed, below-grade utilities building to minimize the Proposed Action's footprint and any potential disturbance to the existing natural environment. The landscape design would conform to LBNL's vegetation management and design guidelines.

PAVED AREAS

As stated, the Proposed Action would add approximately 1.5 acres of impervious surface to the project site. Surrounding undeveloped areas would remain undeveloped and permeable and would continue to support grassland and tree groves. Roads, walkways, and parking areas would be paved with asphalt concrete or Portland cement concrete capable of handling appropriate vehicular and pedestrian traffic. To the greatest extent possible, existing pervious surfaces would be preserved to minimize the amount of storm runoff. The terrace area would be a combination of paved and planted areas. State-of-the-art porous pavement would be considered for use where practical.

UTILITIES

Utilities Corridor

New water supply, electrical power, and natural gas service would be routed along the north side of the proposed Molecular Foundry building, from points of connection on Lawrence Road along the north of the Foundry building into the south side of the proposed Central Utilities Plant building. Two parallel above-ground treated water lines that currently traverse the project site would be removed and replaced (see Figure 3 and 4).

Water Supply

An existing 12-inch high-pressure cold water (HPCW) main is routed beneath Lawrence Road, along with fire and domestic water service to Building 72. Fire protection and domestic water services for the new building would be supplied via a connection to this existing 12-inch HPCW. New fire hydrants would be placed along the lower site with a connection to the existing 6-inch HPCW at the southwest corner of Building 66. The Proposed Action would install low-flow plumbing fixtures and water-saving appliances; other devices and new technology (e.g., drip irrigation, re-circulating cooling systems, etc.) would be considered or employed where practicable to further water conservation. Water supply would be separated into industrial and domestic cold water systems. The industrial system would serve lab sinks and equipment; the domestic system would serve kitchen, restroom, and drinking fountain functions. Water pressure range would be 35 to 50 pounds per square inch. Engineering and safety features such as backflow preventers would be installed where appropriate and feasible. All new projects at LBNL are subject to EBMUD's Water Service Regulations at the time of application for service.

Storm Water

Existing sub-grade storm water drainage piping that currently crosses the proposed Molecular Foundry footprint (see Figure 3) would be re-routed to the proposed lower access road, extending approximately 450 feet from the lower (western) side of Building 72 to the lower (western) side of Building 66. New proposed site storm drains would collect and discharge into this re-routed line (see Figure 4).

Sanitary Sewer

An existing sub-grade 6-inch sanitary sewer line currently crosses the proposed Molecular Foundry building footprint (see Figure 3). This line would be re-routed to the proposed lower access road, extending approximately 450 feet from the lower (western) side of Building 72 to the lower (western) side of Building 66. Sanitary sewage from the Proposed Action would discharge into this re-routed line (see Figure 4).

Natural Gas

An existing sub-grade 3-inch high-pressure natural gas main currently crosses the proposed Molecular Foundry building footprint (see Figure 3). This line would be re-routed, extending approximately 210 feet between the proposed Molecular Foundry building and Building 72 (see Figure 4).

Compressed Air

An existing sub-grade 3-inch compressed air line currently crosses the proposed Molecular Foundry building footprint (see Figure 3). The line would be re-routed to the lower access road, extending approximately 360 feet from between Building 72 and the Central Utility Plant building to the lower (western) side of Building 66 (see Figure 4).

Treated Water

Existing supply and return treated water piping currently crosses the proposed Molecular Foundry building footprint (see Figure 3). This above-grade piping, which extends from the Building 72 complex to Building 66, would be abandoned and removed. Treated water for Proposed Action operations would be supplied from the proposed Central Utility Plant building (see Figure 4).

The Central Utility Plant would supply chilled water, treated water, heated water, purified water, and de-ionized water to the Molecular Foundry. The chilled water would be produced by two 350-ton centrifugal, water-cooled, variable-speed-drive chillers and two water towers located at the northeast corner of the Central Utility Plant building.

Power

A 12,470-volt electrical power supply would be routed from the existing LBNL SW-A5 substation near the Strawberry Canyon entrance gate along Lawrence Road, approximately

1,000 feet east of the project site. The estimated load for the Molecular Foundry operations would be 3,800 kilovolt-amps (kVA), assuming a 30 percent spare capacity.

A 750-kilowatt diesel generator located within the Central Utility Plant building would supply emergency electrical power. A 3,000-gallon aboveground, double-contained tank would supply fuel storage for 48 hours of generator operation. An authority to construct and a permit to operate from the Bay Area Air Quality Management District would be required before the emergency generator could be placed and used.

Natural gas for laboratory work, water heating, and space heating would be supplied to the Molecular Foundry from the Central Utility Plant by a tie-in on the sub-grade gas main along Lawrence Road. Gas would be supplied at 7-inch water column pressure at approximately four cfg per working outlet. LBNL's standard gas meter, pressure regulator, and automatic seismic shut-off valves would be incorporated into the Proposed Action.

Exhaust

The Molecular Foundry building would include one common system for both fume hoods and general exhaust. The exhaust capacity of the Foundry building is estimated to be approximately 25,000 cubic feet per minute for the four primary fans, and 28,000 cubic feet per minute for four standby fans that would comprise the building exhaust system.

An estimated 48 fume hoods would be installed as part of the Molecular Foundry. The normal chemical fume hoods would be variable air volume hoods. Each fume hood would be equipped with a hood-ventilated air sensor. Flammables and corrosives storage would take place in special cabinets either beneath or adjacent to a fume hood, and cabinet vents would be plumbed to the hood exhaust system.

Fume hood exhausts would be located on the Molecular Foundry building roof. Discharge from the fume hood exhaust would meet all applicable vertical velocity and stack height requirements. Air intakes for the Molecular Foundry would be located in different areas of the roof. Potential air re-entrainment from the proximity of fume hood exhausts and air intakes would be avoided through specific engineering and design—including wind-tunnel modeling, if necessary—during the design phase of the Proposed Action.

Telecommunications

Telecommunications services would be provided from the existing telephone and data communications node located south of Building 62.

3.1.5 CONSTRUCTION

Construction would take place over a 24-month period, beginning in approximately January 2004 and ending in approximately February 2006. Construction staging would likely take place in the adjacent corporation yard, downslope of the project site. The staging area would be primarily on two existing plateaus alongside Chicken Creek Road in the Poultry Husbandry Area. These areas

total approximately one-half acre and are currently and historically used for vehicle parking and construction laydown uses (see Figure 5).

Approximately 32,000 cubic yards would be excavated to construct the Molecular Foundry project: approximately 26,500 cubic yards of material would be excavated to construct the Molecular Foundry building, and approximately 5,500 cubic yards would be excavated to construct the Central Utility Plant building.

Excavated fill material, with the exception of topsoil, would not be stockpiled for extended periods but would be used shortly or immediately after it was excavated. If stockpiling were to occur, however, it would take place within the project site boundaries and would adhere to LBNL's standard construction practices and a project-specific Storm Water Construction Permit and Pollution Prevention Plan, such as watering as necessary to minimize dust, and the covering of stockpiled soil to prevent downstream water quality degradation from run-off.

It is anticipated that some dewatering might be necessary during project excavation and construction; however, it would not be expected to contain any chemicals of special concern given the results of sampling conducted in January 2002.[3] Such water, if encountered, could therefore be discharged as specified in the SWPPP that would have to be in place before project construction could begin. It is expected that the SWPPP would rely on such practices as installation of silt traps, fencing, and the use of filter fabric or other measures to protect surface drains and storm sewers during excavation, construction, and dewatering phases of the Proposed Action. Specific erosion and sedimentation control measures, such as construction entrance stabilization, silt traps, netting on slopes, and covering of dirt piles, would be detailed in the Plan.

The foundation of the Molecular Foundry building would consist of 36-inch-diameter drilled, cast-in-place piers that would be approximately 40 to 45 feet long. The Central Utility Plant building would be constructed on a foundation of spread footings. The Proposed Action would not require pile driving.

The Molecular Foundry Project Office, with support from the LBNL Construction Safety Engineer, would monitor the construction site for compliance with LBNL, DOE, CAL/OSHA and CAL/EPA, federal Occupational Safety and Health Administration (OSHA), and U.S. Environmental Protection Agency (EPA), and with other applicable safety requirements identified in LBNL's Work Smart Standards. Monitoring activities would include validation of the contractor's ISM (Integrated Safety Management) program, apprising the contractor of safety criteria pertaining to the construction project, conducting and documenting frequent periodic inspections to verify contractor safety compliance, and ensuring that the construction contractor was meeting ongoing ES&H submittal requirements.

[3] Lawrence Berkeley National Laboratory and BC Laboratories, Inc., *Environmental Sampling Report: Radiological, Organics, and Metals Sampling and Analysis at the Proposed Molecular Foundry Site,* February 1, 2002.

3.1.6 STANDARD LBNL PROJECT FEATURES

LBNL has identified several environmentally proactive measures in its 1987 Long Range Development Plan (LRDP) Environmental Impact Report (EIR), as amended, that are required in all LBNL projects and development to avoid or minimize potentially significant environmental impacts. These mitigation measures have been adopted as part of the LRDP EIR by The Regents of the University of California, and thus are required of all LBNL activities pursuant to the California Environmental Quality Act (CEQA). Consequently, all such measures relevant to the design, construction, and operation of the proposed Molecular Foundry are included in the Proposed Action description as standard features of all such LBNL projects. These measures are pertinent to such environmental resource areas as geology; hydrology and water quality; biological resources, visual quality; land use; air quality; noise; traffic; and hazards and hazardous materials. Measures relevant to and incorporated into the project description of the Proposed Action are listed in Appendix "A" of this document.

3.2 NO ACTION ALTERNATIVE

LBNL is conducting limited nanoscience research in other parts of LBNL and the UC Berkeley campus. Under the No Action Alternative, this limited nanoscience research would continue under current management practices, and no consolidated and centralized facility dedicated to nanoscience research would be built at the site.

3.3 DIFFERENT BUILDING CONFIGURATION ALTERNATIVE

Under this alternative, a smaller building totaling approximately 30,000 sq. ft. would be constructed at the current Proposed Action site. The smaller building is anticipated by the 1987 LBNL Long-Range Development Plan and would be located in the approximate location of the existing parking lot. The smaller building would rely on existing available utilities connections and would be accessible from the Lee Road extension, which runs along the south and southwest perimeter of the adjacent Building 66. For purposes of this analysis, it is estimated that approximately 50 to 90 staff persons would occupy the smaller building. Less laboratory space would be available to researchers on a per capita basis. Such a building would likely be about three stories high with perhaps one sub-grade floor and a smaller accompanying utility building. It would require less excavation and would occupy a somewhat smaller footprint. Most of the trees in the area slated for removal under the current project would probably still need to be removed for construction and fire safety purposes. Less construction equipment and materials would be necessary.

3.4 ALTERNATE BUILDING SITE (ON-SITE) ALTERNATIVE

Under this alternative, an alternate building site would be used for the proposed Molecular Foundry. This alternate site is located in the LBNL "Old Town" area, in the Light Source Research and Engineering Area, near the ALS Synchrotron. This alternate site would require demolition of some or all of the following buildings: 4, 5, 7, 14 and 16. Because of the nature of

existing buildings and historic use of this site, substantial historic work and soil remediation may have to be conducted to prepare this site for the Proposed Action. In addition, site preparation would involve many additional truck trips to haul demolition debris and to remove excavated material that would not be needed for on-site fill. The proposed Molecular Foundry building would be given a lower profile and consequently a broader footprint to avoid having it tower over the Advanced Light Source building, which is an important aesthetic resource of LBNL from both short- and long-range views.

While other potential building sites for such a project may exist at LBNL, this site is the most feasible on-site alternate location to the Proposed Action. In fact, this site was extensively investigated in the preliminary planning stages of the Proposed Action as the possible location of the Molecular Foundry. It would allow for optimal access to the Advanced Light Source and to central LBNL-site amenities.

3.5 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER ANALYSIS

3.5.1 LEASED ON-SITE SPACE

This alternative would house the nanoscience research program and activities in a building financed and built by a "third party" developer (i.e., neither DOE, UC, nor LBNL affiliated) on the LBNL site through a ground lease agreement and then the facility would be subsequently leased back to LBNL. It has been determined that the 30-year lease cost of such a building would be significantly greater than the cost of a new building. As it would be essentially the same building and physical project, there would be no environmental benefits realized by this alternative.

3.5.2 ALTERNATE BUILDING SITE (OFF-SITE)

This alternative would require the acquisition, lease, and/or construction of a facility off the LBNL site to provide for the Molecular Foundry programs and activities. No optimal facilities of the sort appear to both exist and be feasibly available in the immediate area of LBNL – the UC Berkeley campus is itself in need of new, updated laboratory space. Property in the City of Berkeley is relatively expensive and the cost of constructing a building somewhere in Berkeley, Oakland, or Emeryville would be prohibitively expensive and time-consuming and would not likely be buffered from nearby residential uses to the extent the current site is. Putting facilities in a research park in Richmond (or in Oakland, Emeryville, or most of Berkeley's commercial/industrial areas) would be too remote from the LBNL site to realize the benefits of having nearby facilities (e.g., Advanced Light Source, NCEM, etc.), fellow researchers, and LBNL administrative, technical, and facilities support.